

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

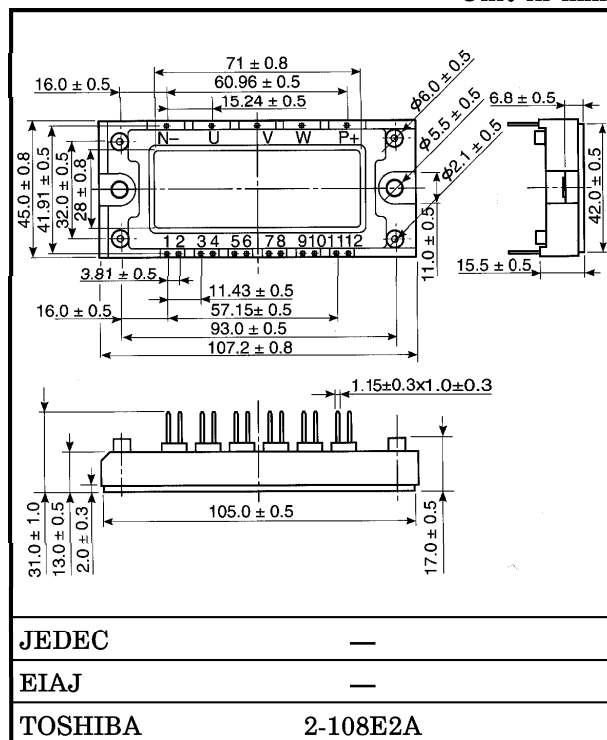
**MG25Q6ES50A**

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

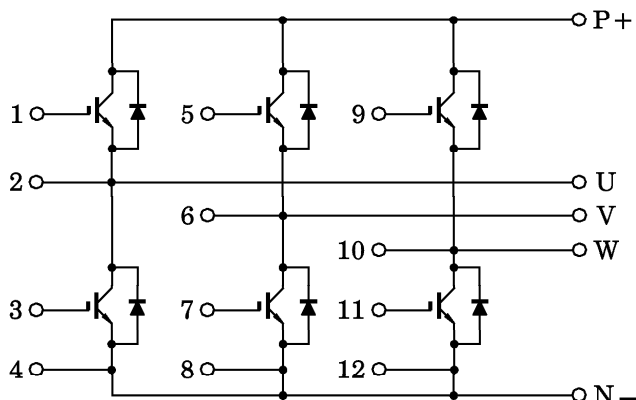
- The Electrodes are Isolated from Case.
- High Input Impedance.
- 6 IGBTs Built Into 1 Package.

Unit in mm



Weight : 185g

## EQUIVALENT CIRCUIT



961001EAA1

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## MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                                         |     | SYMBOL                           | RATING                | UNIT |
|--------------------------------------------------------|-----|----------------------------------|-----------------------|------|
| Collector-Emitter Voltage                              |     | V <sub>CES</sub>                 | 1200                  | V    |
| Gate-Emitter Voltage                                   |     | V <sub>GES</sub>                 | ± 20                  | V    |
| Collector Current                                      | DC  | I <sub>C</sub><br>(25°C / 80°C)  | 35 / 25               | A    |
|                                                        | 1ms | I <sub>CP</sub><br>(25°C / 80°C) | 70 / 50               | A    |
| Forward Current                                        | DC  | I <sub>F</sub>                   | 25                    | A    |
|                                                        | 1ms | I <sub>FM</sub>                  | 50                    | A    |
| Collector Power Dissipation<br>(T <sub>c</sub> = 25°C) |     | P <sub>C</sub>                   | 200                   | W    |
| Junction Temperature                                   |     | T <sub>j</sub>                   | 150                   | °C   |
| Storage Temperature Range                              |     | T <sub>stg</sub>                 | − 40~125              | °C   |
| Isolation Voltage                                      |     | V <sub>Isol</sub>                | 2500<br>(AC 1 minute) | V    |
| Screw Torque                                           |     | —                                | 6                     | N·m  |

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC                       |               | SYMBOL                | TEST CONDITION                                                                                                                      | MIN. | TYP. | MAX.  | UNIT   |
|--------------------------------------|---------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|--------|
| Gate Leakage Current                 |               | I <sub>GES</sub>      | V <sub>GE</sub> = ± 20V, V <sub>CE</sub> = 0                                                                                        | —    | —    | ± 500 | nA     |
| Collector Cut-Off Current            |               | I <sub>CES</sub>      | V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0                                                                                        | —    | —    | 0.5   | mA     |
| Gate-Emitter Cut-Off Voltage         |               | V <sub>GE (off)</sub> | I <sub>C</sub> = 25mA, V <sub>CE</sub> = 5V                                                                                         | 3.0  | —    | 6.0   | V      |
| Collector-Emitter Saturation Voltage |               | V <sub>CE (sat)</sub> | I <sub>C</sub> = 25A, V <sub>GE</sub> = 15V                                                                                         | —    | 2.8  | 3.2   | V      |
|                                      |               |                       | T <sub>j</sub> = 125°C                                                                                                              | —    | 3.1  | 3.7   |        |
| Input Capacitance                    |               | C <sub>ies</sub>      | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz                                                                                | —    | 2600 | —     | pF     |
| Switching Time                       | Rise Time     | t <sub>r</sub>        | V <sub>CC</sub> = 600V<br>I <sub>C</sub> = 25A, V <sub>GE</sub> = ± 15V<br>R <sub>G</sub> = 51Ω, T <sub>j</sub> = 125°C<br>(Note 1) | —    | 0.07 | 0.15  | μs     |
|                                      | Turn-On Time  | t <sub>on</sub>       |                                                                                                                                     | —    | 0.15 | 0.30  |        |
|                                      | Fall Time     | t <sub>f</sub>        |                                                                                                                                     | —    | 0.07 | 0.10  |        |
|                                      | Turn-Off Time | t <sub>off</sub>      |                                                                                                                                     | —    | 0.60 | 0.90  |        |
| Forward Voltage                      |               | V <sub>F</sub>        | I <sub>F</sub> = 25A, V <sub>GE</sub> = 0                                                                                           | —    | 2.0  | 2.8   | V      |
| Reverse Recovery Time                |               | t <sub>rr</sub>       | I <sub>F</sub> = 25A, V <sub>GE</sub> = − 10V<br>di / dt = 400A / μs (Note 1)                                                       | —    | 0.10 | 0.25  | μs     |
| Thermal Resistance                   |               | R <sub>th (j-c)</sub> | Transistor Stage                                                                                                                    | —    | —    | 0.6   | °C / W |
|                                      |               |                       | Diode Stage                                                                                                                         | —    | —    | 1.0   |        |

(Note 1) Switching Time and Reverse Recovery Time Test Circuit &amp; Timing Chart

